Understanding Zambia's Primary Reading Programme:

An analysis of the teaching and learning materials.

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ACRONYMS

CDC	Curriculum Development Center
MESVTEE	Ministry of Education, Science, Vocational Training, and Early Education
NBTL	New Breakthrough to Literacy
PRP	Primary Reading Programme
ROC	Read on Course
SACMEQ	The Southern and Eastern Africa Consortium for Monitoring Educational Quality
SITE	Step Into English
STEP-Up	Strengthening Educational Performance-Up Zambia Project
TLM	Teacher and learning materials
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

The purpose of this study on Zambia's Primary Reading Programme (PRP) was to conduct a comprehensive review of PRP's teaching and learning materials (TLM) for grades 1–3, including teacher and student guides and supplementary readers, to determine the extent to which the TLM are appropriately targeting and sequencing the acquisition of important reading skills, such as introducing simpler skills before introducing more complex ones.

Zambia's Ministry of Education, Science, Vocational Training, and Early Education (MESVTEE), in its attempt to increase learner performance, has identified as one of its priorities the need to improve literacy and early reading. This goal is consistent with USAID's current education strategy, which focuses on improving reading outcomes and increasing the numbers of readers by 2016. In conjunction with its efforts to update the curriculum framework and syllabus, MESVTEE wanted to conduct an analysis of the PRP to provide guidance about how the existing reading program can be further strengthened to achieve improved reading achievement. Strengthening Educational Performance-Up[1] (STEP-Up) is assisting MESVTEE, specifically the Directorate of Standards and Curriculum, in its efforts to gather appropriate and reliable evidence to facilitate decision making to improve Zambia's current early reading program.

The STEP-Up research team developed a set of review criteria for all TLM. These criteria were used by a group of local educators to evaluate the TLM for frequency counts of words, phonemes, and morphemes; sentence length; and the appropriateness of images for their corresponding text. To evaluate the TLM written for the provincial languages, a panel of 38 Zambian educators from across the country was convened for a 3-day meeting to examine the grade 1 New Breakthrough to Literacy (NBTL) TLM. These educators represented rural, urban, government, and community schools, in addition to being experienced in early-grades literacy teaching, familiar with the PRP materials, and proficient in at least one provincial language. These educators worked together with their language groups to apply the review criteria to the TLM, including the NBTL teacher guide and respective NBTL story books. Apart from reviewing the NBTL materials according to the review criteria, educators recorded their general opinions of the PRP, as well as the grade level and cultural appropriateness of the teacher guides and readers based on their experience using the materials in their classrooms.

Researchers from STEP-Up conducted a similar review of the grade 2 Step into English (SITE) and Read on Course (ROC) TLM, (i.e., the SITE and ROC teacher guides, SITE story books, and SITE and ROC activity books), using the same criteria. Because the SITE books were in English, an additional analysis using the Flesch-Kincaid Readability Test was conducted.[2]

In general, the findings from this study show that the TLM do not target or sequence content according to the developmental trajectory on which most young learners acquire important reading skills. The teacher guides for NBTL and SITE also do not define or explain the reading subskills that are important for students to master before they can be expected to read fluently and understand the meaning of text. For example, the NBTL teacher guide does not provide any guidance to teachers about the order in which the story books should be introduced to students. An analysis of the Flesch-Kincaid Readability index for each SITE story book (all of which are direct translations of the NBTL stories) shows that the complexity of the text in these stories varies greatly from one story to the next and the reading difficulty does not gradually progress from easiest to most difficult across reading levels (i.e., red, yellow, and green). These reading levels are also referred to as the "Rainbow levels".

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1   STEP-Up is funded by USAID Zambia, and its primary purpose is to assist the MESVTEE as it undertakes education management reforms to improve learner performance.

2   Flesch-Kincaid Readability Test was originally developed in the late 1940s, has been updated numerous times, and is normed to U.S. grade levels. The Flesch-Kincaid test takes into account words per sentence and syllables per word to determine grade-level readability and appropriateness.

Specifically, the results for each PRP literacy component indicate the following:

- The NBTL teacher guide
    - does not adequately define or explain the majority of literacy subskills;
    - provides some indication of how to assess students on literacy subskills, but not enough to be sufficient;
    - is hard to follow or implement in the classroom, especially without training;
    - includes as core vocabulary some "words" that are not real words unless combined with a suffix or a prefix; and
    - is very prescriptive (e.g., the lessons are scripted, are tightly timed, and provide specific directions for how teachers must organize the students into groups), so implementing the lessons can be challenging for teachers if they do not have the books they need to conduct the lesson and so are unable to deliver the scripted lessons as they appear in the teacher guide or they lack the experience and skills to compensate for the shortage of materials.

- The SITE teacher guide, like the NBTL guide, provides teachers with detailed daily lesson plans that are very prescriptive but can be challenging for teachers if they lack the required teaching and learning materials needed to conduct the lesson.

- The ROC teacher guide provides minimal structure for teachers and presents only suggested exercises from the student activity books at the relevant Rainbow levels. These guides are much less prescriptive and rely much more on teachers' judgment and ability to differentiate instruction to students' varied ability levels.

- Story books
    - incorporate core vocabulary and words of the day to reinforce information learned during the lesson;
    - convey strong morals and values;
    - show a general trend in increasing difficulty across the NBTL story book levels but do not vary much in difficulty across levels in the SITE books;
    - do not always match images to text;
    - present conflicting ideas about the concept of print;[3]
    - are often poorly produced and contain grammatical and spelling errors;
    - suffer from issues related to direct translation of text from English into the local languages, resulting in lost meaning, irregular syntax, and varying levels of difficulty; and
    - are not relevant to children's daily lives and cultural context.

In reviewing the materials used for early-grades literacy instruction, the following actions may be considered to improve the quality and delivery of reading instruction. These actions can be classified into four major areas: teacher training, reading materials, teaching guides, and system support. Some of the main recommendations for each category are as follows:

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3 The recognition of the functions and orientations of print materials (e.g. starting from the beginning of a book), the ability to pretend to read (how to hold and orient print materials), a realization that pictures represent objects, letters and words represent speech, and the ability to distinguish these two. Unlike spoken language, this skill does not come naturally in an environment with minimal or no print exposure, and thus must be fostered.

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- Teacher training should include
  - information about literacy subskills, how the skills can be assessed, theory of how children learn to read, and expectations for students at different grade levels;
  - how to deal with overcrowded classrooms and the lack of instructional time;
  - how to use the PRP TLM for classroom instruction; and
  - how to differentiate instruction based on various reading abilities.

- Reading materials should
  - be accessible and available to all students;
  - be aligned with the curriculum and syllabus;
  - increase in difficulty across the various levels;
  - contain correct grammar, spelling, and syntax;
  - follow a logical progression of literacy skills; and
  - be printed locally and be available at low costs to schools.

- Teaching guides should
  - balance expectations for teacher knowledge and the level of prescriptiveness;
  - clearly define, explain, and provide examples of the literacy subskills;
  - provide clear instruction on how to assess the various subskills; and
  - identify the knowledge and skills students are expected to demonstrate at each level.

- System support should
  - ramp up pre- and in-service teacher training to support PRP;
  - prioritize the printing and distribution of teaching and learning materials to ensure that every child has access to student guides and reading materials; and
  - integrate literacy and language courses into one class.

THE LEARNING CONTEXT IN ZAMBIA

Zambia's Reading Achievement

Evidence to date suggests that most Zambian students are not reading at grade level. Results from the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) show that student achievement in Zambia not only is one of the lowest on the continent but also is declining over time.[4] These declining reading achievement scores prompted the Ministry of Education, Science, Vocational Training, and Early Education (MESVTEE) to examine its reading policies and increase its efforts to strengthen the national literacy program and instructional strategies. MESVTEE believed that two circumstances accounted for low reading levels: (1) children were not receiving literacy instruction in their native language and (2) the teaching and learning materials (TLM) were not of sufficient quality to foster reading comprehension in Zambian children.[5] Although MESVTEE has taken steps to improve reading achievement, including introducing the Primary Reading Programme (PRP) in 2004, reading levels continue to be low in Zambia. Recent findings by two USAID Zambia-funded projects in 2013 indicated that over 90 percent of at least 4,000 students in grades 2 and 3 across several provinces could not read a single word.[6]

Zambia's Language Context

Zambia is a multilingual country, with more than 70 individual spoken languages. Of the multitude of local Zambian languages, seven—Chitonga, Cinyanja, Icibemba, Kiikaonde, Lunda, Luvale, and Silozi—were chosen by MESVTEE as official provincial languages, in part because they are the most widely spoken languages in specific regions of the country. Thus, schools that are located in specific provinces are expected to provide instruction in the provincial language regardless of whether it is the predominant language used within the immediate community. The number and types of languages that each individual speaks typically depend on where the individual is located. For example, in urban locales, it is not unusual for individuals to speak multiple Zambian languages in addition to the provincial language and English. It should be noted that although some of the provincial languages are closely related to one another, others have completely different grammatical and syntax structures.

Multilingual Learning Environment

As an inevitable result of instituting seven provincial languages in a country where more than 70 languages are spoken, children in some regions of the country are exposed to one language at home while receiving reading instruction in a different language at school. Further complicating children's acquisition of reading skills in the provincial language is the instruction of all other subjects (e.g., mathematics, science, health) in English. When MESVTEE introduced the policy that early-grades instruction should be delivered in the provincial language, many parents voiced strong opposition to this policy because they wanted their children to learn English starting in grade 1. To accommodate these parents, MESVTEE decided that in grade 1, literacy and language instruction would occur in the provincial language, while instruction for all the other subjects would remain in English.

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4   Between 1997 and 2003, SACMEQ reading achievement among Zambian students declined 37 scale score points (477.5 to 440.1). See http://www.sacmeq.org/indicators.htm.

5   Sampa, F. K. (2005). African experiences country case studies: Zambia's Primary Reading Programme (PRP). Paris: Association for the Development of Education in Africa.

6   Personal communication with staff at the Read to Succeed and Time to Learn USAID-funded projects.

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A second complicating factor to the learning environment in Zambia relates to teachers' potential lack of familiarity with the local language. New teachers are assigned to schools by MESVTEE on the basis of need; proficiency in the provincial language is not a factor that is considered in these assignments. Under the process by which teachers are assigned to schools, a new teacher may be assigned to a school and not be able to speak or read the provincial language. Thus, it is quite possible for a school to encounter a situation in which students are learning to read in a language that is unfamiliar to them, and the teachers who are teaching reading are unfamiliar with the language that they are teaching students to read.

Access to Print Materials

Another factor that impedes reading achievement in the early grades is the scarcity of TLM in the classroom. Strong evidence suggests that the effect that the TLM have on student learning surpasses that of teacher training.[7] In other words, there is no guarantee of success in classes taught by well-qualified teachers if the quantity and quality of textbooks are inadequate. The current student-to-textbook ratio in Zambia is unknown, but some estimates put it as high as eight students to a textbook.[8] Students' lack of access to textbooks presents a barrier to reading achievement on a number of levels. First, strong evidence indicates that exposing early readers to many different forms of print matter and reading-related activities strengthens their literacy skills (i.e., phonemic awareness, decoding, vocabulary learning, comprehension skills).[9] Second, in countries where print materials are a rarity, the classroom is the only place where children come into contact with words in print form.[10] Under these circumstances, the quality of the TLM becomes even more critical.

Acquiring early-grades reading TLM is fairly arduous given that the publishing rights for the TLM are divided among multiple publishers, two of which no longer operate in Zambia (table 1). Schools generally have to visit bookstores affiliated with each publisher or visit each publisher to purchase the needed books. If a book title is out of print (as is the case for the story books and student activity books in specific languages), schools have to wait until publishers receive multiple orders for the same titles before the books are reproduced. Publishers noted that a book title is not reproduced unless the order is for 10,000 or more books.

Table 1. Publishing Rights for Each PRP TLM Component

Course	Longman	Heinemann	Cambridge
NBTL	Teacher Guide Student Activity Books		Story Books
SITE			Story Books Teacher Guide
ROC		Student Activity Books	Teacher Guide

In addition to the problems associated with acquiring the PRP TLM, their cost poses an additional challenge to schools. The cost of purchasing a set of materials for early-grades reading is twice the amount of schools' annual operating budgets.

7　Chingos, M. M.., & Whitehurst, G. J. (2012). Choosing blindly: Instructional materials, teacher effectiveness and the Common Core. Washington, DC: Brookings Institution. Retrieved from www.brookings.edu/research/reports/2012/04/10-curriculum-chingos-whitehurst

8　Personal communication with MESVTEE

9　Lin, C-H. (2001). Early literacy instruction: Research applications in the classroom (ERIC Digest). Bloomington, IN: ERIC Clearinghouse on Reading English and Communication. Retrieved from http://www.eric.ed.gov/PDFS/ED459424.pdf

10　UNESCO. (2012). Basic learning materials initiative. Paris, France: Author. Retrieved from http://www.unesco.org/education/blm/blmintro_en.php

Quality of Print Materials

Given the influence that the TLM have on education and learning, efforts must be made to not only ensure that students have access to these materials but also that the content of the TLM is at a level of quality that facilitates the desired learning by students. Ideally, the TLM should act as a "bridge" between what is intended to be taught and what is actually taught in the classroom,[11] operationalize the content knowledge and cognitive skills to be learned, and outline a logical learning progression of these knowledge and skills.[12] Only then can the TLM facilitate students' acquisition of new knowledge and skills that is consistent with the desired student learning outcomes.

Purpose of This Review

In assisting MESVTEE in its evaluations of the PRP, STEP-Up conducted a *systematic multiapproach review* of the content of the TLM to examine the extent to which the TLM are appropriately targeting and sequencing the acquisition of important reading skills, such as introducing simpler skills before introducing more complex ones. A systematic multiapproach review of the PRP literacy materials which were first published in 2004 is important because it provides insight into whether these materials are suitable for assisting students who are learning to read. If the materials are not developmentally appropriate, then what is being taught in the classroom is inappropriate for students or inadequate for helping students reach their end-of-year learning targets, both of which can ultimately impede improvement in students' reading.

THE REVIEW OF THE PRP MATERIALS

The current review focuses on the three PRP literacy courses: the *New Breakthrough to Literacy* (NBTL) course, which is designed for students in grade 1 and taught in one of the seven provincial languages; the *Step Into English* (SITE) course, which is used to instruct English literacy to students in grade 2; and *Read on Course* (ROC), which is used to instruct students in grades 3–7 in both English and the provincial languages. Together, these NBTL, SITE, and ROC courses focus on developing literacy in children.

It should be noted that there are 26 story books associated with the NBTL and SITE courses. Each story book is classified into three reading levels of increasing difficulty – red level, yellow level and green level. Students at grades 1 and 2 are expected to progress across the reading levels during the school year. Students who reach the green level are said to have "broken through to literacy". In contrast, the ROC does not include any story books or other reading materials. Instead, ROC encourages its users to identify and utilize print materials from the school library. All courses have activity books for students. There is one activity book associated with NBTL and one for SITE. ROC, however, has eight activity books: four in English and four in each provincial language. Each ROC activity book corresponds with a reading level: red, yellow, green, and orange. Note that ROC includes two additional reading levels (i.e., orange and blue) but there are no activity books that are written to the blue level. Despite the fact that the ROC levels use some of the same colors as the NBTL and SITE levels, it should not be inferred that there is any correspondence among the red, yellow, and green levels that are shared by these courses.

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11 Schmidt, W. H., McKnight, C. C., & Raizen, S. A. (1997). *A splintered vision: An investigation of U.S. science and mathematics education.* Dordrecht, The Netherlands: Kluwer.

12 Van Dormolen, J. (1986). Textual analysis. In B. Christiansen, A. G. Howson, & M. Otte (Eds.), *Perspectives on mathematics education* (pp. 141–171). Dordrecht, The Netherlands: D. Reidel Publishing Company.

The review of the PRP literacy materials was conducted entirely in Zambia. The materials associated with the NBTL were reviewed by Zambian educators, while the SITE and ROC materials (SITE teacher guide, SITE story books, SITE activity book, ROC teacher guide, ROC English activity books) were reviewed by STEP-Up researchers, using the two sets of review criteria it had developed: one for reviewing the teacher guides and the other for reviewing the story books (see Appendixes A and B). Local educators and STEP-Up researchers used the review criteria for the teacher guides to determine how clearly the guides defined and provided guidance on how to teach and assess specific reading subskills (e.g., phonemic awareness, fluency, vocabulary knowledge, reading comprehension), as well as the review criteria for the story books to determine the length and difficulty of words, morphological complexity, sentence complexity, and density of text on a page.

The NBTL materials were reviewed by 38 local educators from across Zambia. Local educators were recruited by the Curriculum Development Center (CDC) on the basis of specific criteria provided by STEP-Up (see Appendix C for details regarding the local educators). STEP-Up requested that each local educator be proficient with one local language, have taught reading to students in grades 1–4 for at least 4 years, and have experience using the PRP materials in the classroom. Collectively, the local educators had to represent various provinces in Zambia and have experience teaching in rural, urban, government, and community schools.

Table 2. Breakdown of Educators by Language Groups

Language	Number of Educators
Chitonga	4
Cinyanja	8
Icibemba	5
Kiikaonde	6
Lunda	4
Luvale	3
Silozi	8

The local educator review meeting was held at the Lusaka Provincial Resource Centre over 3 days. During this meeting, the 38 participating educators were divided into seven local language groups. These assignments were determined by the educators' fluency in the provincial languages. Educators who were proficient in multiple local languages were placed in the language group with fewer members (see table 2 for a breakdown of educators by language group). After educators were placed in their respective language groups, the meeting facilitators (researchers from STEP-Up) oriented the groups to the review criteria. Over the 3-day meeting, each language group reviewed the NBTL teacher guide and corresponding NBTL story books according to the abovementioned criteria. In addition to reviewing the NBTL materials, educators recorded their general opinions of these PRP materials, as well as the grade level and cultural appropriateness of the teacher guides and readers based on their experience using the materials in their classrooms.

LIMITATIONS

Before delving into the results of this review, it is important to note the limitations of this study. This section describes the limitations encountered during this review.

Acquisition of Materials

The biggest challenge faced by STEP-Up was the acquisition of the PRP TLM. Given that various materials are currently out of print or on back order, it was challenging to obtain copies of the NBTL (in all provincial languages), SITE, and ROC materials. Although STEP-Up approached multiple schools and resource centers at the district and province levels, all institutions indicated that they either did not have copies of the PRP literacy materials or that their set of materials was incomplete. In fact, the Lunda group of educators was able to review only three green-level story books and one red-level story book because these were the only Lunda TLM available.

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Insufficient Time for the Local Educator Review Meeting

It should be noted that many groups did not get to green-level story books at all or, at best, reviewed only a few of the green-level stories. The local educator review was originally scheduled to take place over 3 days. However, due to the educators' lack of prior knowledge of the literacy concepts presented, the time that it took to orient the local educators to the activities and conduct the materials review took longer than anticipated. As a result, the team was unable to complete the review as planned because educators could not complete the tasks within the 3 days. In retrospect, adding 1 more day to the meeting may have allowed the local educators to finish reviewing all the NBTL stories and activity books.

Local Educator Familiarity of Literacy Concepts

In general, most local educators lacked knowledge and familiarity with many of the reading subskills and concepts that they were being asked to review the materials for (see Appendix C). This information was captured in the educator survey that was administered before orientation activities began. Results indicated that although a vast majority of the educators claimed to have encountered these literacy terms (e.g., phonemes, morphology, consonants) during their pre- and/or in-service training, many educators were not able to recall specific definitions of these terms or consistently demonstrate their knowledge on specific tasks (e.g., counting the number of syllables, morphemes, and phonemes of simple words). As a result, the facilitators had to spend more time than expected reviewing and training attendees on these key concepts, which, in turn, pushed the agenda back by at least a half day, if not a full day.

The educators' lack of familiarity with literacy concepts also affected the quality of some of the data collected during the review meeting. As part of this review, local educators were asked to review phonemes and phonological complexity (e.g., count the number of consonant-vowel blends, consonant blends, diagraphs, and diphthongs). However, when researchers checked for participants' understanding of the terms and concepts related to phonemes and phonological complexity after the educators had been trained and throughout the meeting, they found that educators' responses varied between language groups and were not consistent with what had been presented during the orientation session. As a result, researchers concluded that the data collected on phonemes and phonological complexity during the local educator review was unreliable. As a result, this report does not present any findings related to phonological complexity.

Materials Reviewed

Under the original plan for the local educator review meeting, local educators were going to be tasked with reviewing the NBTL, SITE, and ROC materials. However, given the time challenges and constraints mentioned earlier, the local educators were unable to complete not only the SITE and ROC materials, but the NBTL materials as well. As a result, local educators reviewed the NBTL teacher guides and story books, and the STEP-UP researchers reviewed the SITE teacher guides, story books, and activity books and ROC materials. The way in which the materials were divided across reviewers is important because it might account for the differences found between the NBTL and SITE materials.

FINDINGS

In general, STEP-Up's analysis suggests that the TLM do not target or sequence the presentation of content according to the developmental trajectory by which young learners acquire important reading skills. Specifically, the teacher guides for NBTL and SITE do not explicitly define, explain, or provide guidance for teaching the reading subskills that are important for students to master before they can be expected to read fluently and understand the meaning of text. Further, unlike the SITE teacher guide, the NBTL teacher guide does not provide any guidance to teachers about the order in which the story books should be introduced to students. Additionally, the analysis of the SITE story books (which are a direct translation of the NBTL stories) shows that the ease of reading does not gradually progress from easiest to most difficult. In fact, the complexity of the text in these stories varies greatly from one story to the next and does not follow a logical progression of increasing difficulty.

This section summarizes findings from the analyses of the PRP literacy materials. Note that more detailed discussions regarding the findings presented below are presented in Appendixes D–G.

NBTL Teacher Guide

The NBTL teacher guide is intended to give teachers a solid basis for teaching initial literacy in grade 1. The guide provides detailed daily lesson plans (i.e., which story books to read and exercises in the activity books to use) and specific techniques for assessing learner performance. The review of the teacher guides shows the following:

- The NBTL guide appears to provide insufficient information on assessing students' acquisition of literacy skills.

- The NBTL guide contains lesson plans that are relatively prescriptive but that might be challenging to implement without sufficient TLM needed to conduct the lesson.

- The NBTL guide contains inadequate definitions or explanations of the majority of literacy subskills.

- The NBTL lessons recommend that the teachers divide the class into four separate groups and set up a teacher learning station through which groups of students rotate over the course of the literacy lesson to conduct specific activities. This strategy would be challenging to implement in classrooms that are overcrowded.

- The NBTL lesson plans are challenging for teachers to implement without training and/or professional development.

- The NBTL guide includes as core vocabulary some "words" that are not real words unless they are combined with a suffix or a prefix.

SITE Teacher Guide

The SITE teacher guide, like the NBTL guide, is intended to give teachers a basis for teaching initial literacy in grade 2. In sum, the SITE teacher guide contains detailed daily lesson plans that are relatively prescriptive and can be challenging for teachers if they lack the required teaching and learning materials needed to conduct the lesson.

ROC Teacher Guide

The ROC teacher guide focuses on the basic and advanced skills for reading and writing and presents exercises from the student activity books at the relevant Rainbow levels. In contrast to the NBTL and SITE teacher guides, the ROC guide is not prescriptive and does not provide information about how teachers should conduct daily lessons. The ROC guide is organized

in this manner largely because one teacher guide provides instructional guidance for multiple grade levels. The review found that the ROC teacher guide provides minimal structure for teachers. The guide only presents suggested exercises from the student activity books at the relevant Rainbow levels. The guide is less prescriptive and relies more on teachers' judgment and ability to differentiate instruction to students' varied ability levels. High levels of teacher training are needed to support teachers in using the guide.

Story Books

There are 26 books containing 36 stories in each of the seven provincial languages for the NBTL course and in English for the SITE course. These story books are intended as supplementary learning materials that allow students to hone their skills by using the techniques they are taught in the classroom. As a result, the books increase in complexity as they progress through the Rainbow levels. The analyses of the data provided by the local educators show that the NBTL vary in difficulty across story books, but these difficulty levels do not change much in the SITE books. Specifically, the results indicate the following:

- The NBTL books contain texts with various difficulty levels—60 to 75 percent easy words, 18 to 22 percent moderately difficult words, and 10 to 18 percent difficult words. In contrast, an analysis of word difficulty in the SITE materials indicated that more than 90 percent of the words are easy.
- Compared with words in the SITE readers, words used in the NBTL stories demonstrate a range of morphological complexities.
- A majority of the words (over 80 percent) used in the NBTL stories are moderately long or long words, whereas over 90 percent of the words used in the SITE materials are either short or moderately long.
- The sentences in the NBTL stories vary and increase in complexity across the levels, whereas more than 75 percent of the sentences in all the SITE readers are classified easy, with few moderately difficult sentences and no difficult sentences in all the readers.
- The amount of text per page in the NBTL stories varies across levels. The amount of text per page in the SITE readers remains consistent across levels.

In addition to evaluating the texts embedded within the story books, the local educators and STEP-Up reviewed the TLM for additional elements. Collectively, the local educators and STEP-Up analysts observed the following:

- The daily lessons introduce the core vocabulary listed in the NBTL teacher guide and the words of the day identified in the SITE teacher guide.
- Some of the stories present important morals and cultural values for the students to internalize while also learning to read.
- The images presented on each page of the story books do not always correspond to the text.
- The rules of print materials taught to children at the beginning of NBTL conflict with how the story books are organized.
- The story books are not error free. For example, a book with a Luvale title contains text in Lunda, and the books (in general) contain some grammatical and spelling errors.
- The stories suffer from issues related to direct translation of text from English into the local languages, resulting in lost meaning, irregular syntax, and varying levels of difficulty.
- Some of the stories are not always relevant to children's daily lives and the cultural context.
- The questions on the back covers of story books typically test prior knowledge instead of students' understanding of the story.

Activity Books

The activity books for the PRP courses are designed to provide students with additional exercises (e.g., matching words to pictures, filling in the blank to spell the word, changing words/sentences from singular to plural) to hone their reading and writing skills. These exercises correspond with the story books to help reinforce students' learning. However, a few issues were noted during the review.

In the SITE activity books, the quality of the exercises could be strengthened if more work is done to

- relate the images and exercises to the SITE story books;
- clearly align the phonics activities to the lessons described in the teacher guide; and
- accurately measure students' mastery of a lesson.

Similarly, in the ROC activity books, the quality of the exercises could be strengthened if more work is done to

- accurately measure students' mastery of a lesson;
- increase the complexity of activities within and across levels while ensuring that the activities are aligned and coherent;
- make sure that the activity books are error free (e.g., one of the exercises in the English activity book was presented in a provincial language);
- ensure that the images presented match to text; and
- improve the quality of the images.

CONCLUSIONS AND RECOMMENDATIONS

Although the initial evaluations of PRP demonstrated that the courses helped Zambian primary school children acquire basic literacy skills,[13, 14, 15] results from recent assessments suggest that the instruction that students are receiving are not sufficient to help them achieve grade-level proficiency in a Zambian language and English. STEP-Up, in collaboration with Zambian educators, conducted an extensive review of the various PRP materials for grades 1–3 to determine what can be built upon as well as what changes are needed to improve reading gains for primary students.

Several positive aspects of the PRP can be built upon moving forward:

- the focus on the assessment of literacy subskills in the NBTL teacher guides;
- the overlap of core vocabulary words and words of the day between the daily lessons and the story books; and
- the emphasis on strong morals and cultural values throughout the stories.

Many aspects of the PRP need to be improved to attain the level of quality that will ensure that students gain the necessary skills to read at grade level:

- The literacy subskills are not well defined in the NBTL materials, and teachers need a solid understanding of the subskills to teach and assess them properly.
- The NBTL materials do not provide adequate instruction on how to assess each literacy subskill.

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13 Sampa, F. (2005). *Zambia's Primary Reading Program (PRP): Improving access and quality education basic schools* (Research coordinated by the Ministry of Education in Zambia). Paris, France: Association for the Development of Education in Africa.

14 MESVTEE & DIFID. (2004). Output to Purpose (OPR) Draft

15 Constable, P., Higgins, C., & Tambulukani, G. (2001). SITE evaluation 2001

- The prescriptive nature of the NBTL and SITE teacher guides typically benefits teachers with little to no training. However, due to the scarcity of TLM in the classrooms, the highly prescriptive nature of the NBTL and SITE teacher guides present challenges to teaching because teachers cannot deliver the lesson to students as designed. Implementing the lessons can be challenging if teachers do not have the books they need to conduct the lesson and so are unable to deliver the scripted lessons as they appear in the teacher guide or they lack the experience and skills to compensate for the shortage of materials.
- The teacher guides are difficult to carry out and do not pay enough attention to how teachers can implement the lessons given conditions of overcrowded classrooms and lack of instructional time.
- Teachers often lack sufficient numbers of instructional materials or texts, making it difficult to properly implement the lessons.
- The ROC teacher guide places a huge responsibility on teachers to be able to assess the various reading levels of students and to differentiate instruction accordingly.
- The SITE readers do not increase in difficulty across the levels.
- Pictures and text do not always match up, and books contain grammatical and spelling errors.
- The local language books suffer from direct translation from English, resulting in lost meaning, irregular syntax, and varying levels of difficulty.
- Stories are often not culturally appropriate or relevant to children's daily lives.

Although these challenges are significant, the PRP materials can be dramatically improved by taking into consideration some of the following recommendations broken down into the categories of (1) teacher training, (2) teaching and learning materials, and (3) system support.

Teacher Training

Through interactions with the local educators, who are considered to be the best Zambian educators, attending the local educator review meeting, it became increasingly clear to the researchers that even these educators had not received adequate instruction on the literacy subskills: what they are, how they are taught, and how they can be assessed. It is important that these basic skills and the terms defining them be adequately addressed and properly explained in teacher guides, but more important, MESVTEE needs to reexamine the pre-service teacher education curriculum to ensure that teachers are being exposed to this content during their initial training. Instructional content should be added to pre- and in-service training to help teachers understand the theory of how children learn to read, the component skills of reading, how those skills can be assessed, and the expectations for students at various grade levels.

Training should also cover how teachers can deal with challenging issues, such as overcrowded classrooms and the lack of instructional time, when implementing the reading curriculum. Additionally, teachers need training on how to use the PRP TLM (teacher and student guides and story books) for classroom instruction and how to adapt them for use in large classrooms. The ROC teachers in particular need detailed training in how to diagnose student reading levels, how to differentiate instruction for the various levels, and how to use the teacher guide as a tool to support instruction. Finally, it would be beneficial if teacher's colleges could incorporate reading and literacy into the curriculum for all teachers, not just those specializing in literacy instruction.

Teaching and Learning

Given the influence that the TLM have on education and learning, efforts must be made to ensure not only that students have access to these materials but also that the quality of the TLM content can facilitate the desired learning by students. It is highly important that the PRP TLM align with the new curriculum and syllabus; increase in difficulty across the grade levels; contain correct spelling, grammar, and syntax; and follow a logical progression of literacy skills. It is particularly important that the translation of materials into other languages be done with extreme caution, with translators always keeping in mind the meaning of the text, the level of difficulty across languages, and proper grammar and syntax. Another way to resolve the translation issues that are prevalent in the current PRP TLM is to develop each set of early literacy materials in each provincial language. This will ensure not only that the stories are relevant and appropriate for the communities that are expected to use these books, but also that vocabulary that is frequently used in spoken language appears in the TLM.

Zambian publishers should hold publishing rights and local printers should print the materials whenever possible to ensure the availability of materials over time. To guarantee continued access of the materials to Zambian schools, publishers who are awarded publishing rights to reading materials by the Ministry must keep adequate copies of the TLM in print while finding ways to reduce their cost. Given that the NBTL and SITE courses are relatively prescriptive, it becomes even more important that schools have access to these reading materials at all times so that teachers have all the materials they need to carry out the literacy lessons as described in the teacher guides.

Highly structured prescriptive teacher guides have positive and negative effects on teaching. For teachers who have not received adequate training, prescriptive guides that provide explicit instructions for how to structure the lesson and scripts for how to explain specific concepts to children enable teachers to teach efficiently without needing a lot of background knowledge. However, teachers who have received a strong training in content and pedagogy may find that prescriptive guides restrain their own creativity and improvisation. A balance needs to be found based on the level of knowledge these teachers will bring with them into the classroom.

Evidence from this review suggests that although many teachers professed to be familiar with the key reading subskills, they were not actually confident in their ability to define or provide examples of the skills. Therefore, MESVTEE staff should not assume that all teachers enter the teaching profession with this knowledge or that teachers retain this knowledge over years of nonuse. As a result, it is important that teacher guides adequately address and properly define these basic terms. Unlike the NBTL and SITE teacher guides, the ROC teacher guide does identify and clearly define the subskills of reading and writing and could be used as an example of how to better explain these skills in the NBTL and SITE guides. The ROC materials also describe the Rainbow Reading Ladder, which is a tool designed to assist teachers in assessing their students and indicates levels of development of literacy skills. The Rainbow Reading Ladder identifies the knowledge and skills that students are expected to demonstrate at each level, and a similar example would prove beneficial for the NBTL and SITE teachers as well. Finally, it is important that developers of early-grades teaching methodologies keep in mind that the classroom structure and teaching methodologies proposed should be appropriate for typical Zambian classes, both large and small. Developers should also consider the amount of instructional time actually available to teachers for literacy instruction.

System Support

If the Ministry's goal is to develop the PRP into an effective program that develops children's reading skills at the appropriate grade and pace, thus resulting in life-long readers, then it must ensure that every aspect of the PRP works toward enhancing that goal. This includes the teaching and learning materials that are provided, the teachers who are teaching those materials, and the systems in which they teach. It is the Ministry's job to ensure that students have access to the texts and supplementary reading materials they need at each grade level and that those materials are based on the most recent research on how children learn to read in a first and second language. Engaging this review of the PRP materials is a good first step in identifying how these materials can be improved to better align with the current research on reading, but more needs to be done.

A larger question that must be asked is whether these materials, even if revised, are the best solution for students. That is a question this small study cannot answer, but one that must remain on the Ministry's radar. For example, the progression of literacy learning beginning only in the first language in grade 1, moving on to only English in grade 2, and then combining both English and first language in grades 3–7 is not what research suggests best supports children's acquisition of literacy skills in both languages. Research thus far indicates that children should have ample time to cement their literacy skills in their first language while focusing on oral skills in the second language. Because English is less familiar, students focus in the early grades on learning English vocabulary so that once they begin to read in English, they will have to focus only on decoding the text and not also on learning the meaning of words. The more time students have to develop literacy skills in their first language, the easier it will be for them to transfer those skills into reading in the second language as long as they already have a sufficient oral knowledge of the language. Therefore, the Ministry may want to revisit the design and sequence of the PRP curriculum so that children have time in the early grades to solidify their literacy skills in the first language before beginning literacy in the second language.

To transform the PRP into a program that consistently helps students attain grade-level literacy, the Ministry will also need to ramp up the pre- and in-service teacher education programs so that they align with the PRP curriculum and adequately prepare teachers for using it in the classroom. Teachers should be entering their classroom with a solid understanding of how children learn to read in a first and in additional languages, the component skills of reading and how they can be taught and assessed, how to diagnose students to determine what reading skills they may be struggling with, and how to provide remedial instruction for struggling readers. Teachers should also enter the classroom with a high level of familiarity with the PRP curriculum and materials. The more exposure they can get to these materials before they begin using them with their students, the better prepared they will be. Particularly with the ROC materials, teachers need to be trained in how to determine at which level their students are reading and how to differentiate their instruction accordingly. This is not a skill that comes easily to all, but one that comes through practice and experience.

Additionally, the Ministry will need to prioritize the printing and distribution of the TLM to ensure that every child has access to student guides and various levels of readers and that every teacher has teacher guides. Finally, it is our recommendation that the literacy and language courses at the primary level should not be separate but instead be integrated into one class. Learning about grammar and syntax is also a part of learning how to read and to decode text and separating these classes can cause confusion for students. Perhaps by integrating these two classes, teachers could devote more time to initial literacy instruction in the early grades.

CHECKLIST FOR TECHNICAL REVIEW OF THE PRIMARY READING PROGRAM (PRP) MATERIALS IN ZAMBIA

Teacher Guide Course Name: _____

Part 1: Please evaluate the teacher guide for the extent to which the following reading sub-skills are mentioned. If a reading sub-skill is mentioned, please indicate the extent to which there are clear definitions of the terms, ways to asses them, and examples of each. Please see the glossary for definitions and examples of all terminology.

Reading Sub-Skills	Contents of Teacher Materials		
	Clear and explicit Definitions (Yes or No)	Ways to Assess (Yes or No)	Examples of each of these skills (Many, Some, None)
Phonemic Awareness			
Phonics			
Fluency			
Vocabulary Knowledge			
Reading Comprehension			
Writing			
Spelling			
Word Structure/Morphological Awareness			
Other?			

Part 2: Please review the teacher guide then answer the following questions. Please circle that best reflects your answer.

1. To what extent do the materials prescribe/dictate the instruction teachers provide each day?

A.	B.	C.	D.
The materials completely prescribe the instruction and lessons.	The materials mostly prescribe the instruction and lessons.	The materials somewhat prescribe the instruction and lessons.	The materials do not prescribe the instruction and lessons.

2. Given the organization and structure of your classroom, can the recommended teaching methods be implemented?

A. Yes	B. No

If not, please explain why: _____

_____

_____

3. Is the information in the teacher guide easy to understand and use?

A. Yes	B. No

If not, what else is needed? _____

_____

_____

4. Does the information in the teacher guides align directly with the teaching and learning materials that the students receive?

A.	B.	C.	D.
Yes, the information aligns with all materials.	Yes, the information aligns with most materials.	No, the information only aligns with some materials.	No, the information does not align with any materials.

5. Have you used this teacher guide in your classroom?

A. Yes	B. No

6. If yes, how was it helpful?

_____

_____

7. What, if anything, would you change about it?

_____

_____

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8. To what extent does the teacher guide cover the reading and writing objectives determined by the Literacy Framework? (For NBTL course only)

A.	B.	C.	D.
The teacher guide fully covers all reading and writing objectives.	The teacher guide covers most of the reading and writing objectives.	The teacher guide covers some of the reading and writing objectives.	The teacher guide does not cover any of the reading and writing objectives.

9. If so, which objectives does it target?

_____
_____
_____

10. To what extent does the teacher guide cover the reading and writing objectives determined by the English Language Syllabus? (For SITE and ROC courses only)

A.	B.	C.	D.
The teacher guide fully covers all reading and writing objectives.	The teacher guide covers most of the reading and writing objectives.	The teacher guide covers some of the reading and writing objectives.	The teacher guide does not cover any of the reading and writing objectives.

11. If so, which objectives does it target?

_____
_____
_____

12. To what extent does the teacher guide cover the reading and writing objectives determined by the Local Language Syllabus? (For NBTL and ROC courses only)

A.	B.	C.	D.
The teacher guide fully covers all reading and writing objectives.	The teacher guide covers most of the reading and writing objectives.	The teacher guide covers some of the reading and writing objectives.	The teacher guide does not cover any of the reading and writing objectives.

13. If so, which objectives does it target?

_____
_____
_____

14. Please write any other comments you may have about the teacher's guide:

_____
_____
_____
_____
_____
_____
_____

APPENDIX B. REVIEW CRITERIA FOR THE STORY BOOKS

<u>MATERIALS IN ZAMBIA</u>

Title of Story Book: _____

Rainbow Color of Story Book: _____

Language (Circle one): Cinyanja   Chitonga   Icibemba   Kiikaonde   Lunda   Luvale   Silozi

<u>**Part 1:**</u> Please review **every page** of the story book. For each characteristic of the materials in the tables below, enter an approximate percentage (%) of the materials that can be described by the terms given in parentheses below. Please see the glossary for definitions and examples of all terminology.

Sentence complexity
Low (single clauses) –
Medium (at least two clauses) –
High (several clauses) –

Pictures that supplement words and stories
Always –
Sometimes –
Never –

Word domain difficulty
Easy (words related to simple topics) –
Medium (words outside immediate context)–
Hard (outside general context of Zambian life)–

Word length
Short (2-3 letters) –
Medium (4-6 letters) –
Long (7 or more letters) –

Word frequency
Frequent (often used) –
Medium (sometimes used) –
Rare (rarely used) –

Phonological complexity (C: consonant; V: vowel)
CV (to, he, do) –
CVC (pen, him, sit, not) –
CC Blend (cr, st, pl, gr, ng, sn, dr)–
CC Diagraph (ph, th, ch, sh) –
Diphthong (right, eight, fear, round, hair) –

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Morphological complexity
Monomorphemic (walk, cat, lady) –
Bimorphemic (walks, catnap, ladylike) –
Polymorphemic (walkers, catnaps, unladylike) –

Density of text on a page
Low –
Medium –
High –

Part 2: Please answer the following questions based on the story book you just reviewed. Please circle that best reflects your answer.

1. Does the story provide repetition and practice of the core vocabulary words (as defined in the teacher guide)?

A. Yes, there is much repetition of core vocabulary words	B. Yes, there is some repetition of the core vocabulary words	C. No, there is little repetition of the core vocabulary words	D. No, there is no repetition of the core vocabulary words

2. Can Zambian children relate to the book's story and images in their daily lives?

A. Yes, the story and images are all relevant	B. Yes, the story and images are mostly relevant	C. No, the story and images are only somewhat relevant	D. No, the story and images are not relevant

3. Have you used this story book in your classroom?

A. Yes	B. No

4. If yes, how was the story book helpful?

_____

_____

5. What, if anything, would you change about the story book?

_____

_____

6. Have you used the English version of the story book in your classroom?

A. Yes	B. No

7.　Were the English version and local language version of equal difficulty?

A. Yes, they were both had equally difficult vocabulary	B. No, the local language book had more difficult vocabulary	C. No, the English book had more difficult vocabulary

8.　Please write any other comments you may have about the story book you just reviewed:

_____
_____
_____
_____
_____
_____

APPENDIX C. PARTICIPANTS' BACKGROUNDS

Before orientation began, a survey (figure C.1) was administered to the educators participating in the review meeting.

FIGURE C.1 Local Educator Initial Survey

Please circle the letter that best represents your answer.

PART 1: Background Information

A. Up until 2012, for how long had you been teaching?				
A	B	C	D	E
Less than 2 years	Between 3-5 years	Between 6-10 years	Between 11-15 years	More than 15 years

B. How many years have you taught Grade 1?				
A	B	C	D	E
Have not taught	Between 0-2 years	Between 3-5 years	Between 6-10 years	More than 10 years

C. How many years have you taught Grade 2?				
A	B	C	D	E
Have not taught	Between 0-2 years	Between 3-5 years	Between 6-10 years	More than 10 years

D. How many years have you taught Grade 3?				
A	B	C	D	E
Have not taught	Between 0-2 years	Between 3-5 years	Between 6-10 years	More than 10 years

E. How many years have you taught Grade 4?				
A	B	C	D	E
Have not taught	Between 0-2 years	Between 3-5 years	Between 6-10 years	More than 10 years

F. What grade did you teach in 2012? (*Mark all responses that are true*)				
A	B	C	D	E
Primary 1	Primary 2	Primary 3	Primary 4	Primary 5

G. Are you male or female?	
A	B
Male	Female

H. How old are you?				
A	B	C	D	E
Less than 25 years old	25-40 years old	41-50 years old	51-60 years old	Over 60 years old

I. What is the highest level of formal education you have completed?				
A	B	C	D	E
Basic Education	Secondary School	Teachers' College	University/Bachelor's	Master's Program

J. What teaching qualifications do you have					
A	B	C	D	E	F
ZATEC	ZBEC	ZPC	Primary Diploma	Primary Degree	Primary Degree

K. In 2012, what subjects do you teach? (*Mark all that are true*)				
A	B	C	D	E
English/ Reading	Local Language/ Reading	Mathematics	Science	Other: _____

L. What is the local language taught at your school in first grade?						
A	B	C	D	E	F	G
Cinyanja	Chitonga	Icibemba	Kiikaonde	Lunda	Luvale	Silozi

Please rate your fluency in the following languages.

	Reading			Writing			Speaking		
	Basic Level 1	Proficient Level 2	Advance Level 3	Basic Level 1	Proficient Level 2	Advance Level 3	Basic Level 1	Proficient Level 2	Advance Level 3
M. Cinyanja	A	B	C	A	B	C	A	B	C
N. Chitonga	A	B	C	A	B	C	A	B	C
O. Icibemba	A	B	C	A	B	C	A	B	C
P. Kiikaonde	A	B	C	A	B	C	A	B	C
Q. Lunda	A	B	C	A	B	C	A	B	C
R. Luvale	A	B	C	A	B	C	A	B	C
S. Silozi	A	B	C	A	B	C	A	B	C
T. English	A	B	C	A	B	C	A	B	C

U. What language do you generally use to teach reading?		
A	B	C
Official local language	Other local language	English

V. What teaching program do you use most often in your classroom to teach reading?						
A	B	C	D	E	F	G
NBTL	ZATEC	ZBEC	SITE	Supplementary Reading Resource Kit	Other: _____	Don't know

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The survey results follow (note that not all participants responded to all questions):

- Among participants, 24 were female and 8 were male.
- Twenty educators were from Lusaka province, 6 from Western province, 3 from Northwestern province, and 1 from each of the following provinces: Central, Eastern, and Southern. No educators represented the Copper Belt, Luapula, Muchinga, and Northern provinces (figure C.2). Although invitations by the CDC were extended to educators in these four provinces, none was able to attend the meeting.
- All educators reported having at least 6 years of teaching experience; 8 educators reported having 6 to 10 years of teaching experience, 6 reported between 11 and 15 years of experience, and 18 noted over 15 years of experience (figure C.3).
- When asked about the highest level of education completed, 2 had completed basic education, one had completed secondary school, 13 had attended teacher's college, 13 held a bachelor's degree, and 2 had completed a master's program (figure C.4).
- Of the 36 educators who responded to the question about the number of teaching qualifications held, 3 reported not holding any teaching qualifications, 25 held one qualification, 5 held more than one qualification.

In addition to responding to questions about their background, educators were administered a short quiz (see figure C.5) so that the STEP-Up researchers could ascertain their knowledge about specific literacy terms and determine how much time to spend orienting participants to those concepts. Of the 33 respondents, 30 were familiar with the literacy terms[16] on the quiz and 3 individuals did not indicate a response. Eighteen individuals indicated that they had encountered these literacy terms while at teacher's college, 2 during in-service teacher training, 9 at both teacher's college and in-service training, and 1 while in university.

Figure C.2. Number of Educators by Province

Province	Educators
Central	1
Eastern	1
Lusaka	20
Northwestern	3
Southern	1
Western	6
Unknown	1
Total	**33**

Figure C.3. Years of Teaching Experience

6–10 years	8
11–15 years	6
Over 15 years	18
Total	**32**

Figure C.4. Highest Level of Education Completed

Basic Education	2
Secondary School	1
Teacher's College	13
Bachelor's Degree	13
Master's Degree	2
Total	**31**

---

16 The basic literacy terms on the quiz were *reading comprehension, decoding, phonics, phonemic awareness, phonological awareness, vocabulary knowledge, morphological awareness, syllables,* and *phonemes*.

Figure C.5. Basic Literacy Terms

A. The understanding of the different ways that spoken language can be broken down into smaller units.
B. The effortless, automatic ability to read words in connected text.
C. The ability to associate sounds with letters and use these sounds to read words.
D. The awareness of the sounds in spoken words.
E. The awareness of the different parts of the word that have/carry distinct/separate meanings (meaning parts/meaning components/meaning functions).
F. Concept of how to print functions.
G. The ability to understand and use words to acquire and convey meaning.
H. The knowledge of properties of a script.
I. The ability to extract meaning from text.

The box above contains definitions of commonly used reading terms (see below). Match these definitions to the reading terms located in the box below by writing the letter that corresponds to the correct definition above in the appropriate space.

Reading terms

1. **Reading Comprehension:** _____

2. **Decoding:** _____

3. **Phonics:** _____

4. **Phonemic Awareness:** _____

5. **Phonological Awareness:** _____

6. **Vocabulary knowledge:** _____

7. **Morphological Awareness:** _____

8. **How many syllables and how morphemes are there in the following words?**

		Syllables	Morphemes
a.	Crocodile	_____	_____
b.	Attached	_____	_____
c.	Unbelievable	_____	_____
d.	Cats	_____	_____
e.	Moon	_____	_____
f.	Gardener	_____	_____
g.	Sympathy	_____	_____
h.	Heaven	_____	_____

9. **How many phonemes are there in the following words?**

a. Ox _____
b. Man _____
c. Thought _____
d. Lamp _____
e. Ocean _____

The average percentage of correct responses on the quiz was 26 percent, with scores ranging from 0 percent to 63 percent correct. Results presented in figure C.6 show that when the scores were analyzed by task (i.e., matching literacy terms to the right definitions, and counting syllables, morphemes, and phonemes for specific words), the maximum percent correct was 44 percent. With the exception of the matching task, teachers who encountered these literacy terms during pre- and in-service training demonstrated the highest scores on the activities where they had to count the number of syllables, morphemes, and phonemes for specific words.

Figure C.6. Educator Prior Knowledge of Basic Literacy Terms

Educators who encountered the literacy terms in:	Percent Correct Basic Literacy Terms			
	Definitions of literacy terms	Counts of syllables	Counts of morphemes	Counts of phonemes
In-service training	36%*	31%	29%	10%
Teacher's college	26%	26%	22%	22%
In-service training and teacher's college	24%	44%*	38%*	31%
University	0%	13%	0%	40%*
No response	10%	29%	19%	7%
All teachers	24%	31%	26%	23%

Denotes the highest percent correct for specific tasks.

APPENDIX D. DISCUSSION OF FINDINGS FOR THE TEACHER GUIDES

Reviews of the NBTL teacher guide indicated that the educators thought that a majority of the literacy subskills were not well defined or explained (figure D.1). Only one language group thought that the term *phonics* was clearly defined in the NBTL teacher guide. A brief but clear and accurate definition of phonics is provided in the NBTL teacher guide on page 3, but the fact that most groups agreed that there was no clear definition indicates that the information about phonics needs to be enhanced.

Figure D.1. Were Literacy Subskills Clearly Defined in NBTL Teacher Guide?
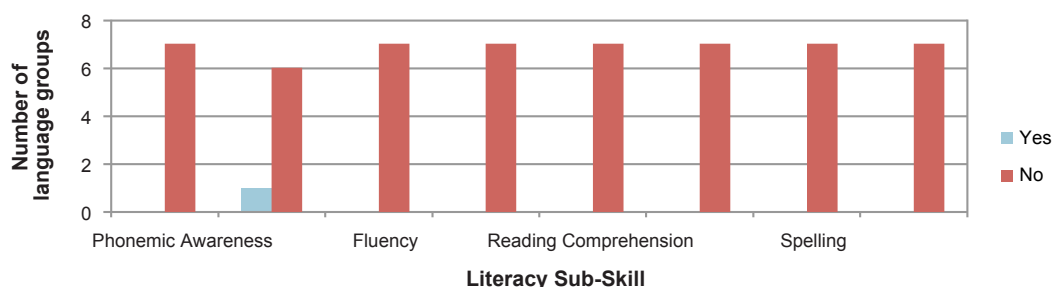
In contrast, half of the educators thought that the NBTL teacher guide provides information about ways to assess students on the literacy subskills, although there was no absolute agreement among the educators about which subskills the NBTL teacher guide describes how to assess (figure D.2). It should be noted that the lack of consensus among educators could reflect their limited understanding of literacy subskills. Regardless, it is evident from the educators' responses that the teacher guide places a greater emphasis on assessing the literacy subskills than on defining what these skills are.

Figure D.2. Did the NBTL Teacher Guide Provide Examples of Ways to Assess Literacy Subskills?
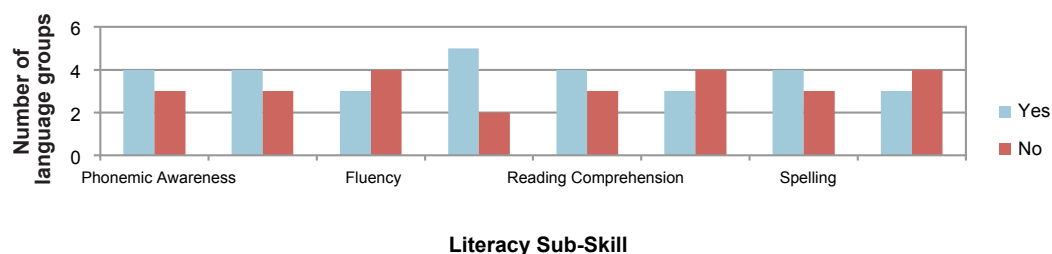
According to educator responses to the open-ended questions on the surveys (figure D.3), most groups of educators thought that the teacher guides were useful in helping teachers with lesson planning. However, educators in four language groups cited overcrowded classrooms and the lack of instructional time (common issues in the Zambian primary schools) as obstacles to following the prescribed teaching methods of the NBTL and SITE courses. Educators were split when it came to determining the ease of use of the teacher guides and their ability to implement the teaching methods prescribed by the NBTL in their classrooms. The educators indicated that the teacher guides were not easy to follow or carry out, especially for teachers not trained in the PRP methodology. Some educators orally expressed that they were not confident about their

ability to use the teaching methods set forth by the PRP. This information is important to note given that the educators attending this review meeting are considered some of the best literacy educators in the country.

Figure D.3. Local Educator Responses to Open-Ended Questions Related to Teacher Guides

Responses	Number of Responses by Language Group
Helps with lesson planning	7
Insufficient time to carryout strategy	4
Content needs improvement	3
Difficult for teacher without proper PRP training	3
Misalignment between strategy and classroom setup	3
New terms not clearly defined	3
Provides benchmarks for where students should be	3
Difficult to understand	2
Inflexible and too prescriptive	1
Insufficient resources and textbooks	1
Teacher guide must be in local language	1

An unexpected finding concerns the list of core vocabulary that students are expected to master by the end of the academic year. Analysis revealed that some "words" embedded in that list do not have meaning unless they are combined with a prefix or a suffix (figure D.4). For example, in Lunda, one of the core vocabulary is "baka," which by itself has no meaning unless is it coupled with the prefix "ka." The core vocabulary for Cinyanja and Silozi, piloted by the Department for International Development (DFID) in 2000, were the only ones with no errors. The errors in the core vocabulary words are problematic particularly for teachers who are assigned to teach literacy in provincial languages with which they are unfamiliar and are unable to discern whether the core vocabulary consists only of real words. Thus, it is conceivable that some students may be learning to read words that have no meaning.

Figure D.4. Errors Noted in the Core Vocabulary Listed in the NBTL Teacher Guide

	Chitonga	Cinyanja	Icibemba	Kiikaonde	Lunda	Luvale	Silozi
Number Core Vocab.	93	95	81	92	94	91	90
Number Errors	18	0	4	14	4	57	0
% Errors	19%	0	5%	15%	4%	63%	0

APPENDIX E. DISCUSSION OF FINDINGS FOR THE STORY BOOKS

An analysis of the difficulty of words in the NBTL and SITE readers showed that a majority of the words in the red-, yellow-, and green-level readers are easy (figure E.1). Keep in mind that word difficulty here refers to whether the word is easily recognizable by the students as a part of their immediate context or whether the word refers to a concept that might be beyond what they know in their daily life (see figure E.2 for definitions). The word-level difficulty remains fairly consistent throughout all the rainbow levels in the NBTL readers; that is, a majority of the words are easy and fewer than 20 percent of the words are considered difficult. There is very little variability in the difficulty level of the words used in the SITE materials, with more than 90 percent of the words considered easy. Because these are beginning-level materials (grades 1 and 2), for the first year of literacy in the local language (NBTL) and the first year of English (SITE), the word difficulty should be at the easy level. This enables children to acquire new vocabulary and practice decoding words that are familiar to their daily context before moving onto more difficult content.

Figure E.1. Story Book Word Domain Difficulty by Level
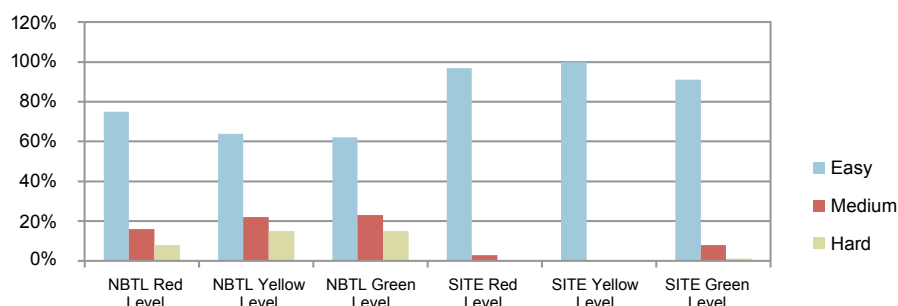
Figure E.2. Definitions of Word Difficulty

- An *easy* word describes simple familiar topics (e.g., *cow, baby*).
- A *moderately difficult* word describes topics outside the student's immediate context, including basic terms related to geography, social science, etc. (e.g., *jungle, clay*).
- A *difficult* word describes topics that are outside the general context of Zambian life and may require high academic knowledge (e.g., *radio transmitter, chameleon*).

Figure E.3. Definitions of Morphological Complexity

- A word that is *monomorphemic* contains only one morpheme (e.g., *walk, cat, big*).
- A word that is *bimorphemic* contains two morphemes (e.g., walk + s = *walks*, walk + er = *walker*).
- A word that is polymorphemic contains more than two morphemes. (e.g., walk + er + s = *walkers*, un + lucki + est = *unluckiest*).

A second indicator of text complexity considered in this analysis was the number of morphemes per word in each story. A morpheme is the smallest meaning unit in a word (see figure E.3 for definitions). An analysis of the data showed that words used in the NBTL stories demonstrate a range of morphological complexities (figure E.4). Although a majority of the words are monomorphemic throughout all the NBTL readers, there is a steady increase of bimorphemic and polymorphemic words in the yellow- and green-level readers. This progression makes sense because it takes time to acquire the knowledge of how words are built, so readers initially will be able to more easily decode monomorphemic words. In the SITE readers, in contrast, over 80 percent of the words are monomorphemic, less than 20 percent are bimorphemic, and almost none of the words are polymorphemic. Again, because the SITE readers are really students'

initial introduction to English literacy, one would expect a high number of monomorphemic words as students are first learning to decode text. However, in the higher levels of story books, the texts should also begin to show an increasing level of bi- and polymorphemic words.

**Figure E.4. Story Book Morphological Complexity by Level**
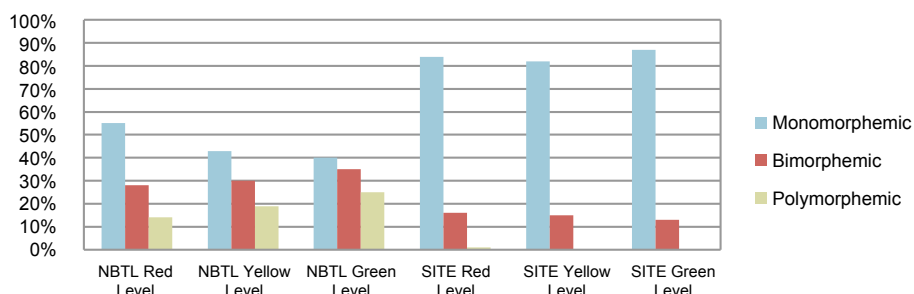
Figure E.5. Definitions of Word Length

- A *short* word contains 2 or 3 letters.
- A *moderately long* word contains 4 to 6 letters.
- A *long* word contains 7 or more letters.

A third indicator that was evaluated as part of the PRP materials review was word length (see figure E.5 for definitions). Results indicated that over 80 percent of the words used in the NBTL stories are moderately long or long words. In contrast, over 90 percent of the words used in the SITE materials are either short or moderately long (figure E.6). Although there seems to be some confusion about in which language the stories were originally written, most of the key individuals who assisted in the development of the NBTL and SITE story books claim that the readers were developed in English and then translated into respective local languages. If this information is accurate, it could explain why a majority of the words used in SITE are short or moderately long, whereas the opposite is true for the NBTL readers. For example, the *short* word *axe* in English is the *long* word *nkhwangwa* in Cinyanja. For this reason, the Ministry should exercise caution in the future. Direct translations are often not appropriate because they can greatly alter the word and sentence length and the complexity from one language to another.

Figure E.6. Story Book Word Length by Level
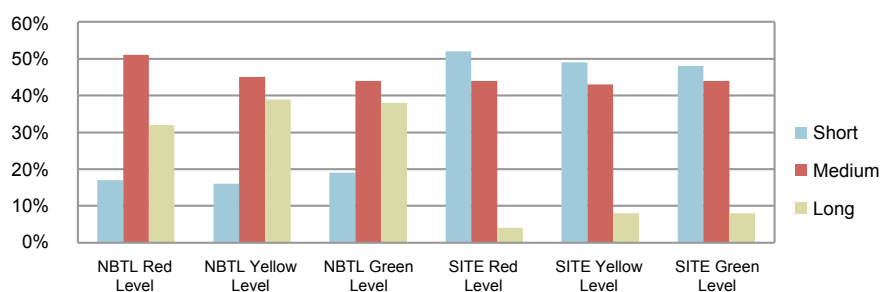
A fourth indicator of text complexity considered in this analysis was sentence complexity (figure E.7). Each sentence of NBTL and SITE stories was evaluated and rated as easy, moderately difficult, or difficult (see figure E.8 for definitions). The results indicate that sentence complexity generally increases across the rainbow levels for the NBTL readers. In other words, the red-level books have mostly easy sentences and few difficult sentences and the green-level books have more difficult sentences and few easy sentences. In comparison to the NBTL readers, more than 75 percent of the sentences in all the SITE readers were classified easy, with few moderately difficult sentences and no difficult sentences in all the readers. One would expect there to be some progression of difficulty from the lower to the higher levels of readers as students gain more skills and ability to decode sentences.

Figure E.7. Story Book Sentence Complexity by Level
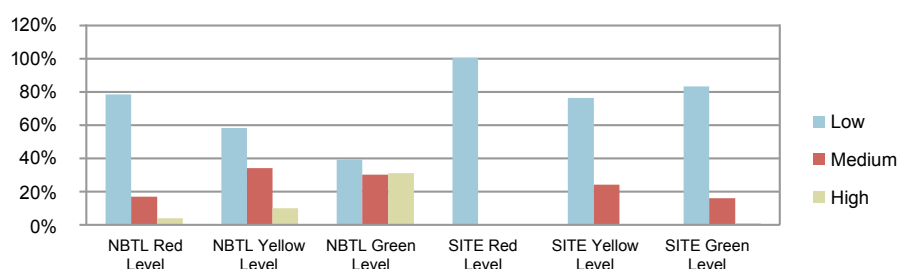
Figure E.8. Definition of Sentence Complexity

- An easy sentence contains a single clause and does not represent multiple ideas.
- A *moderately difficult* sentence contains at least two clauses and represents a few complex ideas within one sentence.
- A *difficult* sentence contains several clauses and represents many complex ideas.

The fifth indicator examined during the local educator review meeting was text density, defined as the amount of space on a page dedicated to text relative to the space set aside for pictures. Pages with easy text density have large pictures and only a small amount of text. Pages that have a harder or more difficult text density have a greater amount of text on the page and smaller or fewer pictures.

The analysis showed that the NBTL readers have varying degrees of text density per story (figure E.9). However, the level of density does not increase with the intended difficulty of the readers. The SITE readers have much less text density within the stories. The distinct differences between the NBTL and SITE readers could be explained in several ways. The rating for this indicator is subjective; hence, raters for the NBTL and SITE materials may have interpreted text density differently. A second plausible reason for the marked difference in ratings is that the local language books (NBTL) do have more text to the stories than the English (SITE) versions (see figure E.10 for an example). In fact, one of the lead developers of the PRP story books mentioned in an interview that the text for the English versions of the stories was deliberately reduced to make the stories easier for Zambian students to comprehend.
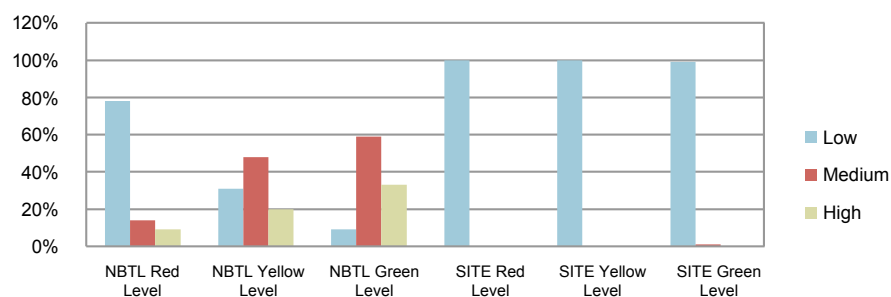
Figure E.9. Story Book Text Density By Level

Figure E.10. A Comparison of the Cinyanja and English Text From the Story "What Is It?"

Pg. #	English	Cinyanja
1	Big legs	Miyendo yanga ili monga makungwa amtengo waukulu.
2-3	Big ears	Makutu anga ali monga mayani aakulu.
4-5	Big back	Khungu langa ndilosasalala.
6	Big nose	Mphuno yanga ili ngati njoka.
7	What is it?	Kodi ndine yani?
8	A big elephant	Njobvu!
Back cover	What other animals are grey?	Ndi nyama ziti zina zomwe ziri ndi cicumba combuwa?

Additional analyses using the Flesch-Kincaid Readability Test were conducted on the SITE story books to assess readability and grade-level appropriateness. The Flesch-Kincaid Readability Test was applied to each story. The results show that the reading difficulty across the SITE story books does not progress sequentially. Instead, the books vary in reading difficulty from one story to another and do not follow any particular pattern (see figure E.11). The Flesch-Kincaid results also indicate that the grade-level reading difficulty of the stories is as high as grade 5.3. In fact, of the 36 stories in the 26 books, 26 stories fall below grade 2 reading level and 10 stories have reading levels that range from grade equivalents of grade 2 to grade 5.3.

Figure E.11. Grade Level Equivalent for Each SITE Story
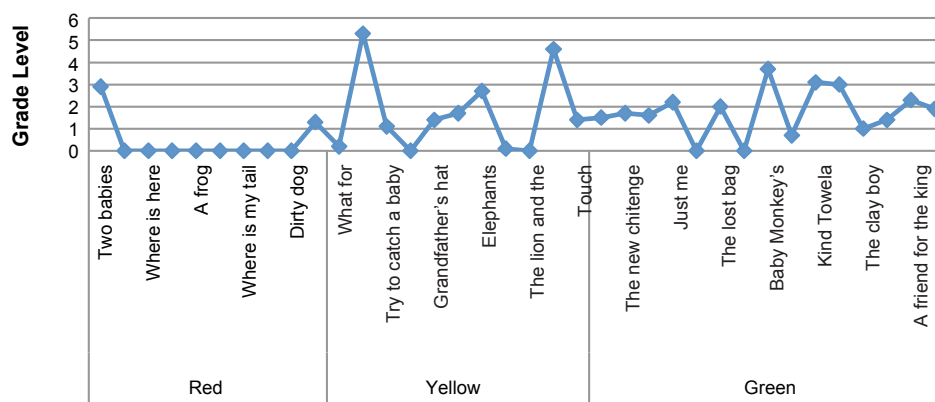
Figure E.12. Local Educator Responses to Open-Ended Questions Related to Story Books

Responses	Number of Comments
Pictures do not match text.	30
Words/sentences are too long or complex for the intended grade or rainbow stage.	24
Story was helpful when introducing new sounds/words/content.	22
There problems with local language translation.	17
Content is accessible and grade-level appropriate for students.	16
Book covers practical content that is important for students to know.	13
Pictures relate to the story.	12
The story is engaging for students in grade 1.	11
Pages are too busy.	7
Students are able to relate to the story's context.	7
Pictures are not realistic.	6
Spelling errors are in the text or spelling is unnecessarily complex.	6
Some content is inappropriate for grade 1.	4
Only specific students can relate to the story.	4
Story uses excessive repetition of the same phrases.	3
Themes of stories contained within the same book lack consistency	3
Book is not appropriate for students with visual impairments.	1
Repetition helps students acquire the intended skills.	1
Story is not clearly written.	1
The book contains incomplete sentences.	1
The questions at the end of the book need to be improved.	1
The story is too short.	1

In addition to having local educators analyze the stories by reading subskills, STEP-Up requested that they provide general impressions about their experiences using the story books to teach literacy skills in children. Specifically, educators were asked how helpful the stories were in developing literacy skills, whether they would change the stories, and for additional comments about the stories.

In particular, a majority of the educator comments pertained to the mismatch between the pictures and the text (30 comments); the words and sentences being too complex for the intended rainbow level (24 comments); and how the stories were helpful in introducing new sounds, words, and literacy content to children (22 comments). See figure E.12 for a summary of all educator comments.

APPENDIX F. FINDINGS FROM QUALITATIVE ANALYSIS OF THE STORY BOOKS

After a thorough qualitative review of the story books for the NBTL and SITE courses, the following results were identified, which could affect the ability of students to appropriately develop literacy skills and the skills necessary for second-language acquisition. In particular, the Rainbow readers are strong in the following areas:

■ *They help introduce new sounds, words, and content to students.* Many of the core vocabulary words from the NBTL course and the words of the day in the SITE course are based on the story books, so the books can be used to reinforce the information learned in the phonics lesson.

■ *They cover practical content and convey strong morals and values.* Some of the stories, such as "Kind Towela," "The Tortoise and the Hare," and "Touch," present important morals and cultural values for the students to internalize while also learning to read. Moreover, students' ability to comprehend what they are reading can be judged by determining whether or not they can uncover the underlying moral in the story.

The readers could be made stronger in the following areas:

■ *The pictures in the story books do not always represent what the text says.* Pictures in books can add to the story and aid understanding, but if the pictures do not accurately depict what the text says, they can also detract from learning. Specifically, on page 20 in the story "Kind Towela," the text states that "Towela was reading in the classroom," but the picture clearly shows Towela writing at her desk. Although this might seem like a small difference, it can be confusing to students learning to read and learning new vocabulary, because matching text to pictures is a key strategy that emergent readers use to make meaning.

■ *The follow-up questions on the back cover of each NBTL and SITE story book makes it difficult for children to form a concept of print.* At the beginning of the NBTL course, children develop an understanding of how print works—the direction of text, what is the cover of a book and what is the end of a book, what a word is, and so on.[17] Therefore, children who have not seen much print in their environment before school (as is the case in most low-income rural communities of Zambia) have to be taught this "concept of print" explicitly in the classroom. If they are not taught it, they must at least be given books that adhere to the "rules" common for books and that do not continue the story or lesson on the back cover, for instance. It is important to note that it is fine for publishers to play with these rules and change things around if they want to be creative, but it is likely to be confusing if this is done for children who have had limited or no exposure to print and books prior to formal reading instruction in school.

■ *There are some issues with low-quality production.* Although poor production quality may not seem relevant to report here, it can have significant impacts on literacy instruction. One of the most obvious examples was the wrong covers appearing on the wrong books. During the local educator review, the Luvale group had to pass a red-level reader that came in their newly purchased story book bundle to the Lunda group because although the cover was Luvale, the contents of the story were completely in Lunda. This is of major concern when teachers are tasked with teaching initial literacy in a local language with which they are not familiar because they may not notice this error and teach students inappropriately.

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17 Teale, W. H., & Sulzby, E. (1986). *Emergent literacy: Writing and reading.* Norwood, NJ: Ablex.

■ *Grammar and spelling errors are rampant throughout the story books.* These issues range from capitalization and punctuation errors to spelling errors and sentence fragments. Although there are discrepancies in grammar rules between English and local Zambian languages, these rules should not be overlooked when producing texts for the explicit purpose of helping children become literate—grammar is an important part of this process. For instance, many books have capitalization errors in which they either erroneously capitalize words that should not be capitalized or use inconsistent capitalization, specifically in stories that are presented like poems, such as "Busy in the Bush." Of most concern, however, are the sentence fragments in many of the English SITE readers. Although no thorough comparison was conducted to see whether these traits also existed in each of the local languages, it was determined that the book "What Is It?" was composed of complete sentences in Nyanja, but fragments in English. The first page of this story says "Big legs." in English and "Miyendo yanga ili monga makungwa amtengo waukulu." in Nyanja. Researchers were informed that this sentence in the local language means "Big legs like a ...," inferring that the latter is a complete sentence. When learning to read, it is imperative that students be taught grammar rules and that the texts they use for initial literacy follow these basic rules.

■ *There are major problems with language translation from English to local languages.* During the local educator review, the issue of problems with direct translation arose. Most story books were originally written in English and then trans-lated into local languages. Unfortunately, the translations were direct, meaning that they were translated word for word as opposed to for meaning. Not only did this confuse much of the syntax of the stories in the various languages, but it also changed the meaning of some parts of the stories, which caused the stories to no longer make sense. This can also contribute to the varying levels of difficulty in the stories, because a story with very simple text in English might require a much higher level vocabulary with much longer words in one of the local languages.

■ *Not all stories are relevant to the daily lives of children from all regions.* Although many stories are supposed to instill a sense of adventure and inform people about the unfamiliar, these traits are not beneficial for students learning to read. Reading material and story lines that are relatable assist in the learning process by enabling children to connect more with what they are reading and start from what they already know and are familiar with. Once students have ob-tained the decoding skills necessary to decipher a text and begin moving onto comprehension, familiar content allows ease of understanding that, in turn, helps grow children's confidence in their reading abilities. Because the stories in the story books are directly translated into each local language, the stories are the same across the country, and not all children throughout Zambia can relate to the stories. For example, students in the Copperbelt Province are familiar with the concept of mining and would be able to relate to stories on the subject, whereas students in certain regions of Southern Province may have never heard of mining before and are more familiar with boats, which are unfamiliar to those in Copperbelt. Therefore, it might be beneficial to tailor stories to the region in which students to aid in their literacy development.

■ *The story books contain some culturally inappropriate references.* In addition to being familiar, stories should be culturally appropriate. It was mentioned that students might not understand the book "What Is It?" because it portrays children riding on elephants' backs. Although elephants are prevalent throughout much of Zambia, they are not domesticated—people do not ride on elephants' backs. Although this particular example seems fairly harmless, it again ties into students having a better chance at understanding a story when the content is familiar to them and relatable.

APPENDIX G. FINDINGS FROM QUALITATIVE ANALYSIS OF THE ACTIVITY BOOKS

The SITE activity books are divided into three distinct sections: Part 1 focuses on phonics activities, Part 2 provides independent group activities, and Part 3 provides pictures and scenes to be used with the Pathway Oral English courses and to promote conversation and story creation.

One positive aspect of the SITE activity books is that many of their images and activities relate to the stories from the SITE story books. The consistent images, story lines, and characters across multiple platforms enable students to connect with the materials in a more in-depth way. If students complete exercises in the activity books that directly correspond to the story they just read, the activity may become more engaging, specifically because the majority of these activities require students to recall the information they read in the books to recreate the story in some way. For example, page 93 of the SITE activity book shows pictures from "The Lion and the Mouse" and asks students to label the pictures with the appropriate quotations provided at the bottom of the page. Students recall the information they read in the book or infer the plot from the pictures even if they did not fully comprehend the story. Inversely, completing exercises related to story book content can provide more reading practice for the students, which can help them understand the story when they read it again after having interacted with it in various ways.

The phonics activities in the SITE activity books all related directly to the prescribed lessons in the teacher guide, progressing in the order the letters and sounds are taught in the classroom, which makes it easy for the teacher to follow. Each page presents one separate letter or sound, provides an alliterative sentence using the sound, and then uses a short activity to ensure that students can distinguish that specific sound from others in both written and oral language. One challenge, however, is that many of these activities seem as though they will not accurately capture students' skill levels. For example, many activities in the phonics section simply have a list of words missing one letter (or in some cases a group of letters) and require students to fill in the blank. Because each word is missing only the phonics sound of focus on that particular page, students merely have to copy the letter into each blank. This does not show mastery of that phoneme or their ability to read the words on the page and decide which letter is missing. Instead, students are able to quickly recognize the pattern and fill in the blanks with ease. It appears that only during revision exercises are students' skills actually tested, which could inaccurately place students in lower pace groups than they need to be in had they had appropriate activities to practice skills prior to the revision day.

Unlike the SITE course, ROC has multiple activity books to be used throughout the course. ROC has eight activity books: four in English and four in the local language. Each set of four is further broken down into Rainbow Reading Levels: red, yellow, green, and orange. As students advance their literacy skills, they advance through these levels until they reach the blue level, which indicates they have reached the highest level of literacy for their age and can continue to improve their skills by practicing both reading and writing at increasing levels of difficulty for the rest of their lives.

Because students are expected to move on from one level to the next as they improve their skillset, it should follow that the activities in the red-level activity book are easier than those in the yellow level and activities should continue on this trajectory through the orange-level activity book. This logical flow is evident in the fact that the red-level activity book revisits phonics activities and spelling. By the time students advance to the orange level, they are beginning to complete exercises devoted to reading comprehension and writing more complex documents. Nevertheless, there is a high variance in the complexity of activities within and across levels. Like in the SITE books, obvious patterns arise when completing many of the

activities, which results in a lack of clarity when assessing whether children are actually learning the desired skill and thinking through the answer or simply responding to the patterns. Moreover, instead of continuing where the final red-level activity left off, the first activity in the yellow-level book reverts back to easier activities, such as those presented in the beginning of the red-level activity book. Even the difficulty of the activities within each activity book fluctuates randomly from easy to hard back to easy and so on. There should be a gradual progression within levels (red, yellow, green, and orange) as well as from one level to the next, with some amount of overlap and revision at the beginning of each new level to solidify students' skills.

Other challenges with the ROC activity books are that they switch between multiple languages, do not accurately match images to text, and contain poor-quality images, all of which can complicate students' ability to learn to read. For example, the exercise on page 36 of the ROC English red-level activity book "Parts of a Flower" provides instructions in English but then uses local language text when labeling parts of the flower. Likewise, the images are of poor quality. For example, the word jug is presented, but the accompanying picture is not actually a jug in the traditional sense—it is a measuring glass full of liquid. Additionally, the developers added some realistic pictures (as opposed to computer-generated graphics), but the quality was sacrificed during production so these images do not add anything to the activity books or exercises. These errors, coupled with low-quality pictures and graphics, can also detract from the learning experience by distracting students unnecessarily.